

Technology

A State-of-the-Art Plant Refines Newspaper Recycling

By CLAUDIA H. DEUTSCH

THOMAS ECK, the Southeast Paper Manufacturing Company's assistant technical manager, understands every cog in every machine in Southeast's recycled-paper plant here. He cheerfully answers the same questions, again and again. Ask him if he is bored, and he says, "Oh, no, this is fun."

Hopefully for Mr. Eck, he means it. Ever since September, when Southeast unveiled its latest expansion, which cost in the neighborhood of \$325 million, a steady stream of visitors has been flowing through.

Small wonder. This plant represents the first time the latest technology for every step of the paper recycling process has been amassed in one place. "There is no bigger, newer or more state-of-the-art mill in the world," said J. Rodney Edwards, vice president of the American Paper Institute's Paperboard Group. "Southeast is by far the most efficient converter of used newsprint." Southeast sells the paper it produces at the plant for \$589.68 a ton, before discount, the same price per ton as virgin paper.

Paper makers have moved slowly into recycling. They have been encumbered by large and expensive existing plants, often in remote locations, and by depressed prices for newsprint. Currently, only nine recycling plants exist and they are operating at full capacity. But as pressures to recycle in-



Conveyor belts carry old newspapers to a pulping machine.

crease, new plants will have to be built.

When paper is made from wood, the raw material — wood fiber — rarely represents more than 10 percent of costs. But collecting and transporting old newspapers can account for 20 percent of a recycling mill's costs.

Thus, recyclers always try to set up near a city that can supply used newspapers. Dublin, however, is located some 60 miles east of Macon, near extensive stands of loblolly pine. Southeast once used a lot of virgin wood to make its paper, which explains why it built here.

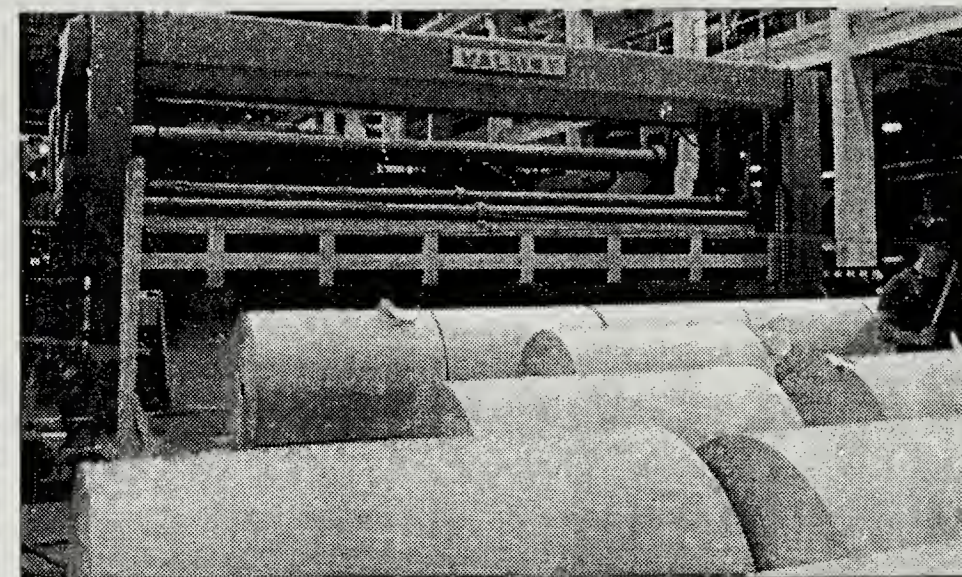
But now the company uses 100 percent old newspapers — about 425,000 short tons per year — which it trucks in from as far as 600 miles away. Ronald F. Wilson, Southeast's chief executive, says that freight costs account for one-third of the company's raw materials costs; at a better-sited plant, freight costs would be about one-sixth. Southeast has had to push for efficiency to survive. (About 40 percent of Southeast's output goes to its three owners, Media General Inc., Knight-Ridder Inc. and Cox Enterprises Inc.)

Environmental considerations, not economics, are driving recycling today. Every ton of old newspapers taken out of the waste stream saves 3.3 cubic yards of critical landfill space. Which is why many companies are planning new paper-recycling mills.

LAST year about 5.3 million short tons of old newspapers, or about 35 percent of all newsprint, were collected for recycling. About 2 million tons were recycled into fresh newsprint by one of the nine North American recycling plants; the rest was either exported or turned into paperboard. Mr. Edwards predicts that by 1995, 7 million tons, or half of all the newsprint used, will be recycled.

In moving from yesterday's trash to tomorrow's newspaper, that newsprint will likely follow the path that Southeast uses today.

Each day, old newspapers are moved from Southeast's 17 acres of warehouses to the mill. A worker shovels the newsprint onto a



High-quality recycled newsprint is priced the same as virgin paper.

continuous conveyor, which feeds it into the pulping machine. In the pulper — a machine that works like a kitchen blender — large contaminants like cans are mechanically filtered out, and the paper is mixed with water and chemicals.

As the pulp flows out of the pulper, electronic sensors check its consistency. If it is too thick, the conveyor belt feeding the raw newsprint slows down; if it is too thin, the belt speeds up. Computers also control the flow of chemicals into the pulper.

The pulp next moves through a centrifugal cleaner and through mechanical screens designed to remove progressively finer contaminants. The final cleaning is through machines with slots eight one-thousandths of an inch wide that remove "stickies" — globules of pressure-sensitive glue. Southeast is the first recycling plant to use these machines.

By this time the pulp is free of mechanically filterable items, but it is by no means "clean." For that, it needs de-inking. At Southeast, the pulp is run through rotating hollow cylinders that have fine-mesh screens for walls. Water and ink push through the screens to the center of the cylinders; the de-inked pulp clings to the outsides.

At this stage the pulp could be turned into paper. But the paper would register no higher than 52 on a brightness scale of 100 (magazine paper registers at least 85). Newspaper publishers once considered 52 the minimum. But as more newspapers print color, they are insisting on brightness levels of at least 58. Southeast now uses hydrogen peroxide, sodium silicate and sodium hydroxide to brighten the pulp.

As a final step the bleached pulp goes through refiners, machines that strengthen paper's cellulose fibers. These fibers are like smooth plastic tubes, and they contact each

other with a minimum of friction. The refining machines have rotating disks that roughen the fibers, raising fibrils that mat with those of other roughened fibers, making them bond like strips of Velcro. "Since the main strength of paper comes from mechanical bonding of fiber, the result is much stronger paper," Mr. Eck explained.

FROM the refiners, the pulp goes to the paper-making machines and to increasingly automated systems for cutting, capping and otherwise turning huge sheets of paper into manageable rolls of newsprint.

Start to finish, the process is extremely water intensive. Southeast uses some 19 million gallons a day, much of which winds up as sludge, a thick goo that is primarily water and fiber but also includes ink and metal wastes.

Until recently Southeast got rid of sludge by spraying it on land. Now the company squeezes out about half the moisture and uses the partially de-hydrated sludge as fuel. It has installed a new type of boiler developed in Finland that burns half coal and half sludge. Pollutants like fly ash and sulfur dioxide are neutralized or recycled inside the boiler.

A computer network coordinates every process in the plant. Soon, it may do even more. Southeast is working on ways to electronically regulate the flow of old newspapers onto the conveyor, and of bleaching chemicals into the pulp. Eventually, one push of a button in a central location will start the whole paper-making process rolling.

Industry insiders say that Southeast is planning another, even more modern plant. So, while competitors look at the Dublin plant as state of the art, Southeast may see it as just a dry run.

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Joy Episalla is a painter whose work deals with images derived from industrial objects and the disjunction of the manufactured and the handmade. For this project, she has researched plastic recycling and has utilized plastic lumber* a recycled waste product extruded from post-consumer commingled plastic waste.

* Thanks to Thomas J. Nosker, Ph.D., Project Manager
Center for Plastics Recycling Research
Rutgers University, New Jersey



RECYCLED — POST CONSUMER TOPA
~~ADULTS~~ "COMMINGLED PLASTIC WASTE"

AT THE Center for Plastics, RUTGERS Univ.

JOY EPISALLA '90



TOP ↑

" PLASTIC LUMBER "

AT : CENTER ~~FOR~~ PLASTICS, RUTGERS UNIV.

JOY EPISALLA '90

4B

96%



TOP A

Recycled - "POST CONSUMER" COMMINGLED PLASTIC WASTE
AT: CENTER FOR PLASTICS - RUTGERS UNIV.

JOY EPISALLA '90



TOP ↑

R2 B2 (Plastic Division) Recycling Plant
"Baled - PET PLASTIC BOTTLES"
Sitting on WOOD PALETTE.


JOY EPISALLA '90

At an infinite number of points on an enduring and repetitive basis, a flow of products, objects, and various materials (altered or amended during use by a human organism) leave or are expelled from the hand or the consciousness of the human user. This flow of not-ingested material has been commonly called garbage.

Due to the undeniability of its physical and conceptual accumulation, the subject garbage has become more than a collection or amalgam of discrete, discarded and unfortunately present objects, sub-objects or materials. Garbage has become the waste stream. The waste stream, managed by diverse systems and economies throughout history, has become a visceral economy through the economies-of-scale of late industrial production. The waste stream as an undifferentiated mass implodes conceptually back to garbage and explodes physically as strangling volume. The waste stream as a differentiated series of post-consumer and post-industrial product flows becomes vital economic energy. While common western and urban practice has institutionalized the water-borne removal of sewerage out-of-sight below the commensurately sanitized and improved street, the waste stream still flows and is moved visibly on the level of this improved street.

Public space is that space which has to do with the waste stream or its denial. Public space is where the expelled products, objects, and materials must negotiate spatial, economic and physical transitions. Public space begins at that point where the individual organism releases or expells the object, product or material into the waste stream. Future definition and possibility of public space will be influenced by the dialectics between concepts and practice of *the public* and concepts and practice of *the waste stream*.

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